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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,902	11/12/2003	Hee Yeop Chae	AMAT/8501/ETCH/DRIE/JB	7748
55649	7590	07/18/2006	EXAMINER	
MOSER IP LAW GROUP / APPLIED MATERIALS, INC. 1040 BROAD STREET 2ND FLOOR SHREWSBURY, NJ 07702			TRAN, BINH X	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/706,902	Applicant(s) CHAE ET AL.	
	Examiner Binh X. Tran	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 3-38, 41-42 is/are allowed.
- 6) ☒ Claim(s) 39 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 39-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the last step of claim 39, the term "the photoresist" (in the phrase "dissociating and ionizing the process gas mixture to etch the photoresist") lacks antecedent basis. In lines 3-4 of claim 39, applicants disclose the "substrate comprising a sacrificial light absorbing material and a dielectric material". Applicants fail to disclose the substrate also comprises a photoresist layer along with the sacrificial light absorbing material and a dielectric material.

Claim 40 is indefinite because it depends on indefinite claim 39.

Response to Amendment and Arguments

3. The applicant's amendment with respect to claim 1 is sufficient to overcome the examiner's previous rejection. The applicant's argument with respect to claim 19 is persuasive (page 10 and page 12 of the remark). Thus, the examiner withdraws the previous ground of rejection.

Allowable Subject Matter

4. Claims 1, 3-38, 41-42 are allowed.

Art Unit: 1765

5. Claim 39 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

6. Claim 40 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is an examiner's statement of reasons for allowance: Respect to claims 1, 3-18, the cited prior arts fail to disclose the step of selectively etching the sacrificial light absorbing material over a dielectric layer using a gas mixture comprising a hydrofluorocarbon gas, a nitrogen-containing gas, an oxygen-containing gas, an inert gas and at least one of a hydrogen-containing gas or a fluorine-rich fluorocarbon gas in combination with all other limitations in the claims. Respect to claims 19-38, 41-42, the cited prior arts fail to disclose the step of removing the photoresist material and the sacrificial light absorbing material using a gas mixture comprising a hydrofluorocarbon gas, a nitrogen-containing gas, an oxygen-containing gas and an inert gas in combination with all other limitations in the claims. The closest prior art (Lee et al. US 2004/0132291) teaches to selectively etch a dielectric material to form a trench using a mixture of a main gas (e.g. C_xF_y , $C_xH_yF_z$), an inert gas, and optionally at least one of O_2 , N_2 and CO_x (paragraph 0044). Lee further teaches to remove the photoresist layer and the remainder of the via filler (160) (i.e. light absorbing material) using H-based plasma obtained from N_2 , N_2/H_2 , NH_3/H_2 , He/H_2 or a mixture thereof.

Conclusion

Art Unit: 1765

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh X. Tran

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